

TRANSLATION OF AMENDMENT (NOVEMBER 28, 2005)
UNDER ARTICLE 34 OF PCT

CLAIMS

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(amended) 1. A semiconductor device comprising:

a semiconductor substrate;

a gate insulator formed on the substrate; and

a gate electrode having a metallic compound film, the
10 gate electrode being formed on the insulator,

wherein: the metallic compound film in the gate
electrode is formed by CVD using a material containing a metal
carbonyl, and at least one of a Si-containing material and a
N-containing material;

15 the metallic compound film contains the metal in the
metal carbonyl and at least one of Si and N; and

the work function of the metallic compound film can be
controlled by changing the content of at least one of Si and N in
the metallic compound film.

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2. The semiconductor device according to claim 1, wherein
the metal constituting the metal carbonyl is selected from the
group consisting of W, Ni, Co, Ru, Mo, Re, Ta, and Ti.

25 3. The semiconductor device according to claim 1, wherein
the metal carbonyl is $W(CO)_6$.

4. The semiconductor device according to claim 1, wherein
the Si-containing material is selected from the group consisting
30 of silane, disilane, and dichlorosilane.

5. The semiconductor device according to claim 1, wherein
the N-containing material is selected from the group consisting
of ammonia and monomethyl hydrazine.

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(amended) 6. The semiconductor device according to

claim 1, wherein the metallic compound film is formed by using further a C-containing material, and

the metallic compound film contains the metal in the metal carbonyl, at least one of Si and N, and C.

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7. The semiconductor device according to claim 1, wherein the metallic compound film is doped with an *n*-type impurity or a *p*-type impurity.

10 8. The semiconductor device according to claim 1, wherein the gate electrode further comprises a silicon film formed on the metallic compound film.

(amended) 9. The semiconductor device according to
15 claim 6, wherein the C-containing material is selected from the group consisting of ethylene, allyl alcohol, formic acid, and tetrahydrofuran.

(amended) 10. A semiconductor device comprising:
20 a semiconductor substrate;
a gate insulator formed on the substrate; and
a gate electrode formed on the insulator,
wherein: the gate electrode comprises: a metallic
compound film; a barrier layer formed on the metallic
25 compound film; and a silicon film formed on the barrier layer;
the barrier layer is formed by the use of a material
containing a metal carbonyl, a N-containing material, and a
C-containing material;
the barrier layer contains the metal in the metal carbonyl,
30 N, and C;
the metallic compound film is formed by the use of a
material containing a metal carbonyl, and at least one of a
Si-containing material and a N-containing material;
the metallic compound film contains the metal in the
35 metal carbonyl and at least one of Si and N; and
the work function of the metallic compound film can be

controlled by changing the content of at least one of Si and N in the metallic compound film.

11. The semiconductor device according to claim 10, wherein
5 the metal constituting the metal carbonyl is selected from the group consisting of W, Ni, Co, Ru, Mo, Re, Ta, and Ti.

12. The semiconductor device according to claim 10, wherein
the metal carbonyl is $W(CO)_6$.

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13. The semiconductor device according to claim 10, wherein
the N-containing material is selected from the group consisting
of ammonia and monomethyl hydrazine.

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14. The semiconductor device according to claim 10, wherein
the C-containing material is selected from the group consisting
of ethylene, allyl alcohol, formic acid, and tetrahydrofuran.